

Teenagers cannot concentrate because their brains are undeveloped

June 2 2010, by Lin Edwards

(PhysOrg.com) -- New research from the UK has found that teenagers and young adults find it hard to concentrate because their brains are more similar to those of much younger children than those of mature adults, with more grey matter but lower efficiency. The findings suggest the brain is not fully developed until people reach their late twenties or even early thirties, which is much later than previously thought.

The researchers, Dr Sarah-Jayne Blakemore and colleagues, from the Institute of [Cognitive Neuroscience](#) at the University College London, used [MRI](#) scans to monitor the activity in the brains of 200 volunteers aged between seven and 27 as they tried to run through the alphabet mentally or with letters on a computer screen while simultaneously deciding whether or not the letters contained a curve. At the same time they had to ignore distracting letters without curves.

The results found the human brain continues to develop longer into the teenage years and adulthood than previously believed, with the abilities of the volunteers improving with their age. In the teenagers an unexpectedly high level of activity was observed in the part of the brain known as the prefrontal cortex, which is a region known to be involved in multi-tasking and making decisions. This suggests their brains had to work harder to process the information. The same type of activity was known to occur in the prefrontal cortex in the brains of young children, but was not expected to continue into the teens and beyond.

The researchers said the results indicate the brains of teenagers are

working less efficiently than adults' brains. Dr Blakemore said the part of the brain needed to solve the problem is still developing in the adolescents, and the activity in the [prefrontal cortex](#) indicates they are doing a lot of needless work with "chaotic thought patterns".

Blakemore said the research shows "there is simply too much going on in the brains of [adolescents](#)" for them to concentrate on the task at hand. That means resources and energy in the brain are wasted, which has a negative effect on decision-making.

The brain's [grey matter](#) consists of the cell bodies and connections that carry messages within the brain. As we age, the amount of grey matter decreases, which Blakemore said means neural transmissions travel more efficiently in adults, and the [brain](#) works more effectively.

The research paper is due to be published today in the *Journal of Neuroscience*.

More information: Iroise Dumontheil, et al., Development of the Selection and Manipulation of Self-Generated Thoughts in Adolescence, The Journal of Neuroscience, June 2, 2010, 30(22):7664-7671; [doi:10.1523/JNEUROSCI.1375-10.2010](https://doi.org/10.1523/JNEUROSCI.1375-10.2010)

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